

## NEW SPECIES OF NEW ENGLAND SARCOPHAGIDÆ.\*

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*Sarcophaga bullata*, n. sp.

1913. *Sarcophaga georgina*\*\* Felt, N.Y. State Museum, Bull. 165, Rept. State Entomologist for 1912, pp. 80-82, pl. 7, figs., 1, 2 and 3†. Habitats; description of larval habits and of puparium.

1914. *Sarcophaga* sp., Parker, Can. Ent., vol. 47, p. 422. Related to *S. cooleyi* R. Parker.

*Types*—Massachusetts Agricultural College, one male, one female.

*Paratypes*—Massachusetts Agricultural College, 1 ♂, 1 ♀; United States National Museum, 1 ♂, 1 ♀ (No. 19167); American Museum of Natural History, 2 ♂, 3 ♀; Boston Society of Natural History, 2 ♂; Cornell University, 1 ♂, 1 ♀; collection of J. M. Aldrich, 1 ♂, 1 ♀; collection of writer, 6 ♂, 5 ♀.

(♂) Third antennal segment two and one-half to three and one-half times length of second; anterior portion of cheek clothed with black, posterior with whitish hair; hairs fringing calypters dark at fold, otherwise whitish except that those on inner portion of margin of upper (anterior) calypter are often dark; all tarsi shorter than their respective tibiæ; anterior and posterior faces of posterior tibia with an equally strong beard of long, coarse, black hairs; hairy vestiture of lower surface of middle tibia increasing in length distally, short and not forming anterior and posterior beards; ventral surface of anterior coxa completely clothed with bristles that may be divisible into three irregular rows; only last two pairs of posterior dorsocentrals strong; except at sides, second and third ventral plates clothed with short, decumbent hair; genital segments dull orange, first either with hair-like, or weak marginal bristles.

\* Contribution from the Entomological Laboratory of the Massachusetts Agricultural College.

\*\* Provisionally determined.

† Figure 4, labelled as the genitalia of this species, is of *Phormia regina* (Meigen).

October, 1916

(♀) Third antennal segment two to three times length of second; anterior portion of cheek clothed with black, posterior with whitish hair; hairs fringing calypters dark at fold, otherwise whitish except that those on inner portion of margin of upper (anterior) calypter are often dark; ventral surface of anterior coxa with other bristles than those of the irregular rows at each side, sometimes more or less distinct row between them; only last two pairs of posterior dorsocentrals strong; abdomen clothed with short, reclinate bristles; genital segments slightly protuberant; the two broad, lateral lips of the first genital segment dull orange, near their edges usually turned abruptly backward (more protuberant), spiracles nearest to anterior margin: fifth segment not discernible, its spiracles when visible seem to open through lips of notum sixth (first genital segment); ventral plates of genital segments usually concealed.

*Length*—9 to 15 mm., average 12 to 14 mm.

(♂) *Head*—Viewed from side parafrontals and genæ, with dark reflections. Breadth of front at narrowest part from one-half to four-sevenths eye width; cheek height varies from one-third to one-half that of eye. Front rather prominent, sides of frontal vitta usually parallel but often slightly convergent backward or the sides effaced just below ocellar triangle (especially in large specimens). Second antennal segment brownish at tip, rarely blackish throughout; third two and one-half to three and one-half times length of second, its inner, basal portion often pinkish or salmon-coloured; arista plumose to beyond the middle. Back of head somewhat convex, typically with two complete rows of black cilia beyond eyes, sometimes with a partial third especially dorsally, otherwise clothed with whitish hair that completely covers metacephalon. Anterior portion of cheek clothed with black, posterior with white hair. Gena sparsely clothed with short hair or sometimes with three irregular rows on that half nearest eye orbit.

*Chaetotaxy*—Lateral verticals absent; vibrissæ inserted just above line of oral margin.

*Thorax*—Metanotum clothed with short, quite erect, close set bristles. Hairs covering anterior spiracle dark brown basally, at least their outer halves yellowish; those of anterior margins of

posterior spiracle either entirely dark brown or with yellowish tips, those of spiracular cover vary from brown with yellow tips to almost wholly yellowish. Epaulets dark.

*Wings*—Bend of fourth vein normally a strongly acute angle; anterior cross-vein more basal than end of first longitudinal; third vein bristly; costal spine vestigial; section III of costa equals approximately one and two-thirds times section V; posterior margin of alulae with or without fringe of hair; calypters whitish, fringe of hairs dark, otherwise whitish, but those on inner portion of margin of upper (anterior) calypter often dark.

*Legs*—Dark; all tarsi shorter than their respective tibiae. Posterior trochanter with well defined "brush," especially in large specimens: femur sub-cylindrical, clothed beneath with long hair that often becomes beard-like posteriorly; anterior face with three rows of bristles, those of intermediate row shortest and not developed distally; posterior face without ventral row of bristles; tibia sometimes slightly curved, anterior and posterior faces each with an equally strong beard of long, coarse, black hair: fourth segment of tarsus at least one-half fifth. Middle coxa with a single row of bristles: femur clothed beneath on posterior proximal half or more with long hair; anterior ventral row of short bristles complete, posterior row represented only by "comb" extending proximally to the long hair: hairy vestiture of lower surface of tibia increasing in length distally but short and not forming anterior and posterior beards; submesotibial bristle present. Ventral surface of anterior coxa completely clothed with bristles that are sometimes separable into three irregular rows, one at each side and an intermediate that is usually less complete and sometimes indistinct.

*Chatotaxy*—Anterior dorsocentrals short, slightly longer than vestiture of praescutum but slightly reclinate and not projecting above it; acrostichals absent; inner presuturals, if present, very weak: last two pairs postsutural dorsocentrals strong, anterior to these three or four pairs that are weaker than those before the suture; praescutellar acrostichals present: scutellar apicals present: usually three sternopleurals, sometimes two but generally only on one side: lower sternopleura with a single row of bristles.

*Abdomen*—Oval or somewhat conical; nota clothed above with short reclinate bristles, beneath with slightly longer, almost erect hair. Ventral plates, as a whole, with their sides converging posteriorly; vestiture of first long and erect, that of second and third short and decumbent except at sides. Posterior margin of fourth notum dorsally, also sometimes ventrally, usually of same colour as genital segments, sometimes not so coloured.

*Chaetotaxy*—Second segment without marginal bristles; third with two, often very stout; fourth with complete row ending ventrally in long hairs.

*Genital Segments*—Prominent, often completely exposed, dull orange. First, (g. s.1) large, often partially yellowish pollinose, vestiture slightly shorter than that of second, "humps" almost bare, in profile weakly curved, marginal bristles weak or hair like; second (g. s.2) rotund, not flattened, anal area small and not extending above middle of posterior surface. Forceps (f.) darkened at least on distal half, in profile the fine, hairy vestiture is seen extending almost to tips of prongs, which are strongly curved forward and approximated almost to tips but latter slightly spread; base with upward flap-like extensions clothed with fine hair that is slightly shorter than vestiture of second segment. Base of fourth ventral plate usually shows as a rounded ridge the posterior extremity of which is slightly knobbed showing prominently in profile, inner portion of lamellæ at base thickly set with short, stubby bristles forming a "brush."

*Genitalia*—Distinctive. Accessory plates (a. p.) hairy; anterior claspers (a. c.) scarcely longer than posterior. (p. c. = posterior claspers; p. = penis.)

(♀) Females differ from males in the following important characters.

*Head*—Breadth at front at narrowest part varies from about five-sixths to same as eye width. Upper, inner orbits of eyes diverging downward.

*Thorax*—Bristly vestiture shorter.

*Legs*—All tarsi equal in length to tibiae. Posterior trochanter with slender apical bristle: femur spindle-shaped; anterior face essentially with but two rows of bristles, those of lower row few and well separated, intermediate row may be represented by two

or three bristles proximally; posterior face with ventral row of long, well separated bristles on proximal half or slightly more. Anterior and posterior ventral rows of middle femur complete, but bristles weak and inconspicuous distally: submesotibial bristle very strong, sometimes a short bristle just above it.

*Chaetotaxy*—Anterior and anterior postsutural dorsocentrals shorter: usually three sternopleurals, sometimes four on one or both sides: lower sternopleura with a single row of bristles, often with several others just anterior to its lower part, otherwise clothed with hair.

*Abdomen*—Oval; vestiture practically throughout of short, reclinate bristles.

*Genital Segments*—Slightly protuberant, visible only from beneath or sometimes bristles of first segment may be seen from above. The two broad lateral lips of the first genital segment distinctly separated dorsally, their edges usually abruptly turned backward and fringed with bristles that decrease in length and size ventrally, dull orange, often yellowish pollinose, spiracles nearer to anterior than posterior margin. Fifth segment not discernible as such, its spiracles rarely visible and apparently open through lips of sixth segment (first genital). Ventral plates of genital segments concealed.

Described from 15 males and 12 female specimens, 62 others examined.

*Range*—New England: MASS.: Woods Hole, Cohasset, Gloucester, Rockland, North Abington, Andover, Forest Hills, Wellesley, Amherst, Springfield; ME: Fryeburg, Capens; CONN.: New Haven.

United States—N. Y., N. J., N. C., Ga., Fla., La., Ill., Ohio, Ind.

The fact that the vestiture of the anterior portion of the cheeks is black and that the posterior is white together with the two beards of equivalent value on the posterior tibiæ is sufficient to distinguish males of this species from others known in New England at least. *Sarcophaga hæmorrhoidalis* Meigen and *S. dalmatina* Schiner while very distinct might possibly be confused with it by one not familiar with the group; the above characters will immediately differentiate them. Females of both these species

are separated from *S. bullata* by the character of the cheek vestiture and the notum of the first genital segment which is composed of one piece, as are the abdominal nota, and not divided into two lips. In addition, the female of *S. dalmatina* has one complete row of cilia behind the eyes instead of two.

In a discussion following the description of *Sarcophaga cooleyi* R. Parker (Can. Ent., vol. 46, pp. 417-423, Dec., 1914), known at present only from Montana, Wyoming and Utah, it was suggested that this species and *S. bullata* were close relatives. The genital segments of the females are very similar; those of *cooleyi* are interesting in that they show (at the sides) parts of a distinct fifth abdominal (sixth morphological) segment with its spiracles.

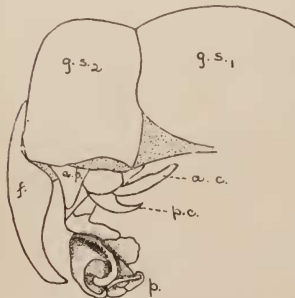


Fig. 19. *Sarcophaga bullata* n. sp., genital segments of male.

Among my material are several reared specimens of *S. bullata* which have light rather than dark palpi. The parts of the penis may be less compact and separated to a greater extent than figured in the drawing.

Felt (1913, see bibliography) described the larval and pupal stages from specimens reared on the head of a dead calf. From larviposition to adult was found to take from thirty-four to thirty-six days (Aug. 12 to Sept. 15 to 17). Dr. Felt very kindly sent

me six females from the specimens reared, which are unquestionably *S. bullata*. Metz (Station for Experimental Evolution, Cold Spring Harbor, Long Island), during the summer of 1914 reared this species on meat in several experiments. Undoubtedly it breeds in carrion. I also have records of its capture on cow dung, and at Springfield, Mass., captured it on human excrement. One specimen in the Massachusetts Agricultural College collection is labelled as caught flying around the "burrows of *Cryptorhynchus lapathi* (Linnæus)." A female received from C. H. Richardson was captured on cow dung. Specimens have also been reared from eggs.

(To be continued)